

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of processing a substrate on a ceramic substrate heater in a process chamber, the method comprising:

forming a protective coating on the ceramic substrate heater in the process chamber prior to placing a substrate on the substrate heater, including:

(a) exposing the ceramic substrate heater to a metal-containing gas to deposit a first layer of the metal on the ceramic substrate heater, and

(b) exposing the ceramic substrate heater to at least one non-metal-containing gas to deposit the at least one non-metal on the first metal layer,

wherein the protective coating comprises a surface portion a non-metal layer surface portion for receiving a substrate, and wherein the surface portion is one of a non-metal layer or a combined metal/non-metal layer; and

processing at least one substrate on the coated ceramic substrate heater.

2-6. Canceled

7. Canceled

8. (Currently Amended) The method according to claim 1 claim 7, wherein the non-metal layer surface portion of the protective coating includes a first surface portion for receiving a substrate and a second surface portion that remains exposed when the first surface portion receives a substrate, and wherein the processing includes placing the at least one substrate on the first surface portion of the non-metal layer surface portion of the protective coating and thereafter subjecting the substrate to a process during which a second layer of the metal is deposited on the second surface portion of the non-metal layer surface portion.

Application No. 10/814,768
Response dated October 4, 2007
to Office Action mailed June 4, 2007

9. (Original) The method according to claim 8, further comprising:
 - removing the processed substrate from the process chamber; and
 - again exposing the coated ceramic substrate heater to the at least one non-metal-containing gas to deposit an additional non-metal layer on the second metal layer and on the first surface portion of the non-metal layer surface portion.
10. (Original) The method according to claim 9, further comprising repeating the processing, removing, and again exposing until a desired number of substrates having been processed.
11. (Currently Amended) The method according to claim 1 ~~claim 7~~, wherein the non-metal layer surface portion is silicon or carbon.
12. (Original) The method according to claim 1, wherein the ceramic substrate heater comprises at least one ceramic selected from the group consisting of AlN, Al₂O₃, SiC, and BeO.
13. (Previously Presented) The method according to claim 1, wherein the metal of the protective coating comprises Re, Ru, Ta, Ni, or Cr or a combination of two or more thereof.
14. (Previously Presented) The method according to claim 1, wherein the metal-containing gas comprises at least one metal-carbonyl gas selected from the group consisting of Ru₃(CO)₁₂, Ni(CO)₄, Co₂(CO)₈, Rh₄(CO)₁₂, Re₂(CO)₁₀, and Cr(CO)₆.
15. (Original) The method according to claim 1, wherein the non-metal-containing gas comprises a silicon-containing gas, a hydrocarbon gas, an oxygen-containing gas, or a nitrogen-containing gas or a combination of two or more thereof.

Application No. 10/814,768
Response dated October 4, 2007
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16. (Original) The method according to claim 1, wherein the non-metal-containing gas comprises SiH₄, Si₂H₆, SiCl₂H₂, Si₂Cl₆, an alkane, an alkene, an alkyne, O₂, O₃, CO₂, CO, N₂, NO, NO₂, or N₂O or a combination of two or more thereof.

17. Canceled

18. (Previously Presented) The method according to claim 35, wherein the metal-containing gas comprises Ru₃(CO)₁₂ and the non-metal-containing gas comprises SiH₄.

19-22. Canceled

23. (Original) The method according to claim 1, wherein the forming further comprises heating the substrate heater to between about 100°C and about 800°C.

24. (Original) The method according to claim 1, wherein the forming further comprises heating the ceramic substrate heater to between about 300°C and about 600°C.

25. (Original) The method according to claim 1, wherein the processing comprises:
providing a substrate to be processed on the coated ceramic substrate heater;
performing a process on the substrate by exposing the substrate to a process gas; and
removing the processed substrate from the process chamber.

26. (Original) The method according to claim 25, further comprising forming a non-metal layer on the coated ceramic substrate heater following the removing, and repeating the processing at least once.

Application No. 10/814,768
Response dated October 4, 2007
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27. (Original) The method according to claim 26, wherein the non-metal layer comprises Si.
28. (Original) The method according to claim 25, wherein the performing comprises carrying out at least one process selected from the group consisting of a TCVD process, an ALD process, a PECVD process, and an etching process.
29. (Original) The method according to claim 25, wherein the performing comprises depositing a metal layer on the substrate.
30. (Original) The method according to claim 1, further comprising repeating the forming and processing without cleaning the substrate heater.
31. (Original) The method according to claim 1, further comprising cleaning the substrate heater and repeating the forming and processing.
32. (Original) A method of processing a substrate on a ceramic substrate heater in a process chamber, the method comprising:
 - forming a Si/Ru protective coating on the ceramic substrate heater in the process chamber, including:
 - exposing the ceramic substrate heater to $\text{Ru}_3(\text{CO})_{12}$ to deposit a Ru layer on the ceramic substrate heater, and
 - thereafter, exposing the ceramic substrate heater to SiH_4 to deposit a Si layer on the Ru layer; and
 - processing at least one substrate on the coated ceramic substrate heater, including:
 - providing a substrate to be processed on the coated ceramic substrate heater,
 - performing a Ru deposition process on the substrate by exposing the substrate to $\text{Ru}_3(\text{CO})_{12}$; and

removing the processed substrate from the process chamber.

33. Canceled

34. (Previously Presented) The method according to claim 32, further comprising forming a Si layer on the protective coating following the removing, and repeating the processing at least once.

35. (Currently Amended) A method of processing a substrate on a ceramic substrate heater in a process chamber, the method comprising:

forming a protective coating on the ceramic substrate heater in the process chamber prior to placing a substrate on the substrate heater, including:

(a) exposing the ceramic substrate heater to a metal-containing gas to deposit the metal, wherein the metal-containing gas comprises a Ru-containing gas ~~and the non-metal containing gas comprises a silicon containing gas~~, and

(b) exposing the ceramic substrate heater to at least one non-metal-containing gas to deposit the at least one non-metal, wherein the non-metal-containing gas comprises a silicon-containing gas,

wherein the protective coating comprises a surface portion for receiving a substrate, and wherein the surface portion is one of a non-metal layer or a combined metal/non-metal layer; and

processing at least one substrate on the coated ceramic substrate heater.